



Perspectives on the IT R&D Ecosystem

**National Academies Public Meeting
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Washington, DC

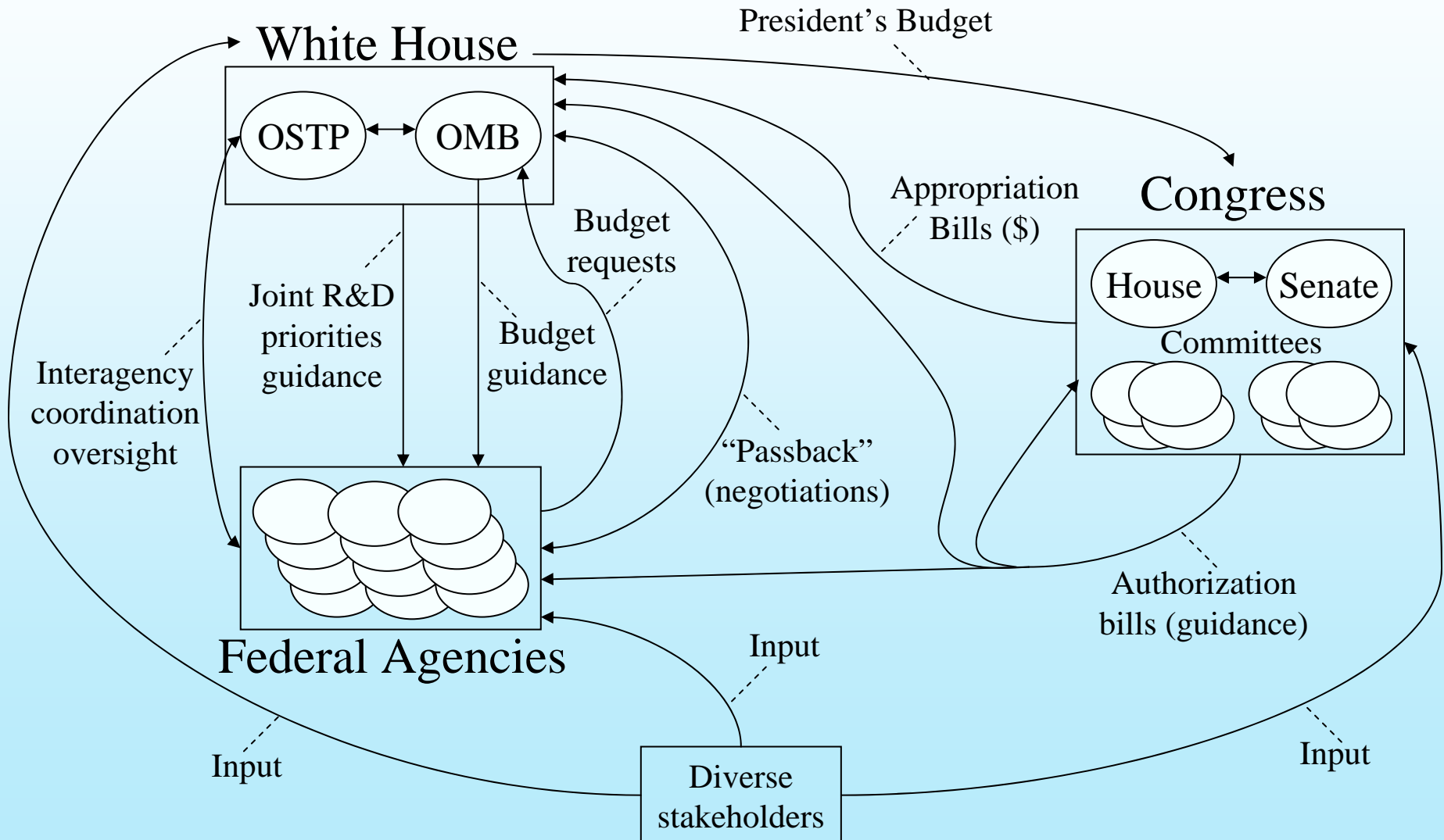
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Director

**National Coordination Office for
Networking and Information Technology
Research and Development (NCO/NITRD)**

- Overview of the Federal R&D Funding Process
- NITRD Program Overview
- NITRD Interagency Coordination
- President's Council of Advisors on Science and Technology (PCAST) study on networking and information technology
- Closing Thoughts

Simplified Overview of the Federal R&D Funding Process



Approximate Sequence of Events

- **Executive Branch budget cycle:**
 - Agencies begin preparing budget requests (spring)
 - OMB provides budget guidance to agencies (summer)
 - OMB/OSTP issue joint memorandum on interagency R&D priorities (typically summer)
 - Agencies submit budget requests to OMB (around September)
 - Passback (negotiations between agencies and OMB) starts in late November
 - Budget rollout in early February
- **Legislative Branch budget cycle:**
 - Timing of passing of authorization bills varies, and sometimes does not occur
 - Passing of appropriation bills ideally takes place before the start of a new FY (October 1), but later appropriations are common
- **Interagency coordination of R&D takes place continuously**
- **Input from external stakeholders takes place continuously**

Added Complexities

- **Negotiations within the White House**
- **Negotiations within the House, within the Senate, and conferencing between the House and Senate**
- **Authorization bills have no actual funding attached to them**
- **Appropriations works within construct of jurisdictional boundaries**
- **Influence of special interests can lead to undesirable earmarks**
- **Time lag inherent in budget cycle**
 - FY 2009 budget will be prepared in FY 2007
- **Overlapping budget cycles**
 - Fiscal Year (FY) 2007 involves execution of 2007 activities, rollout of 2008 budget, and planning and preparation of 2009 budget



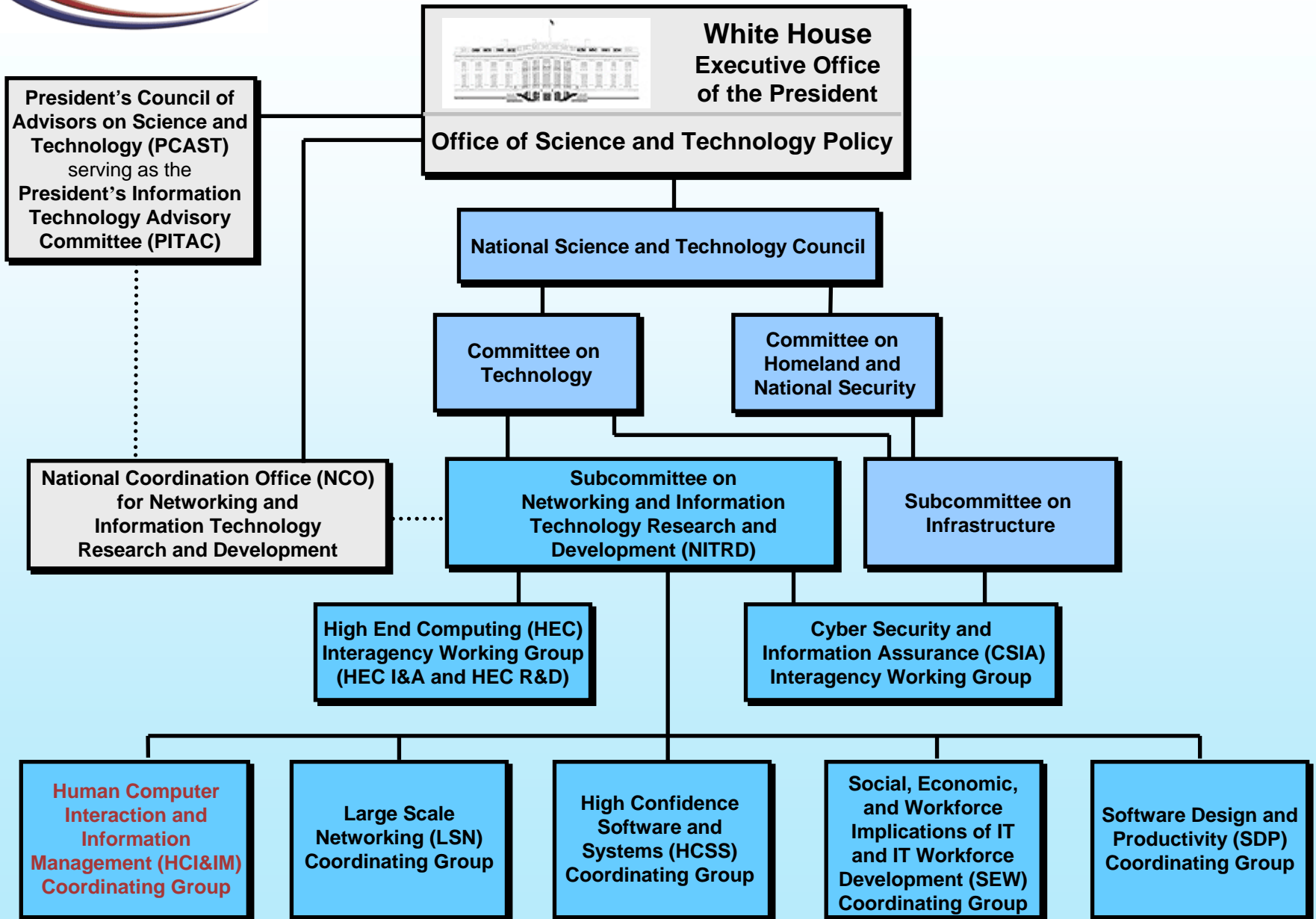
Overview of the NITRD Program

- **Program budget of \$3.1 billion proposed for FY 2007**
- **The NITRD Program is organized into technical domains called Program Component Areas (PCAs)**
- **The activities in the PCAs are coordinated through the NITRD Subcommittee of the National Science and Technology Council (NSTC)**
 - Has two Interagency Working Groups (IWGs) and five Coordinating Groups (CGs)
 - Representatives from
 - 14 program member agencies
 - White House Office of Management and Budget (OMB)
 - White House Office of Science and Technology Policy (OSTP)
 - NITRD National Coordination Office

Scope of NITRD Program

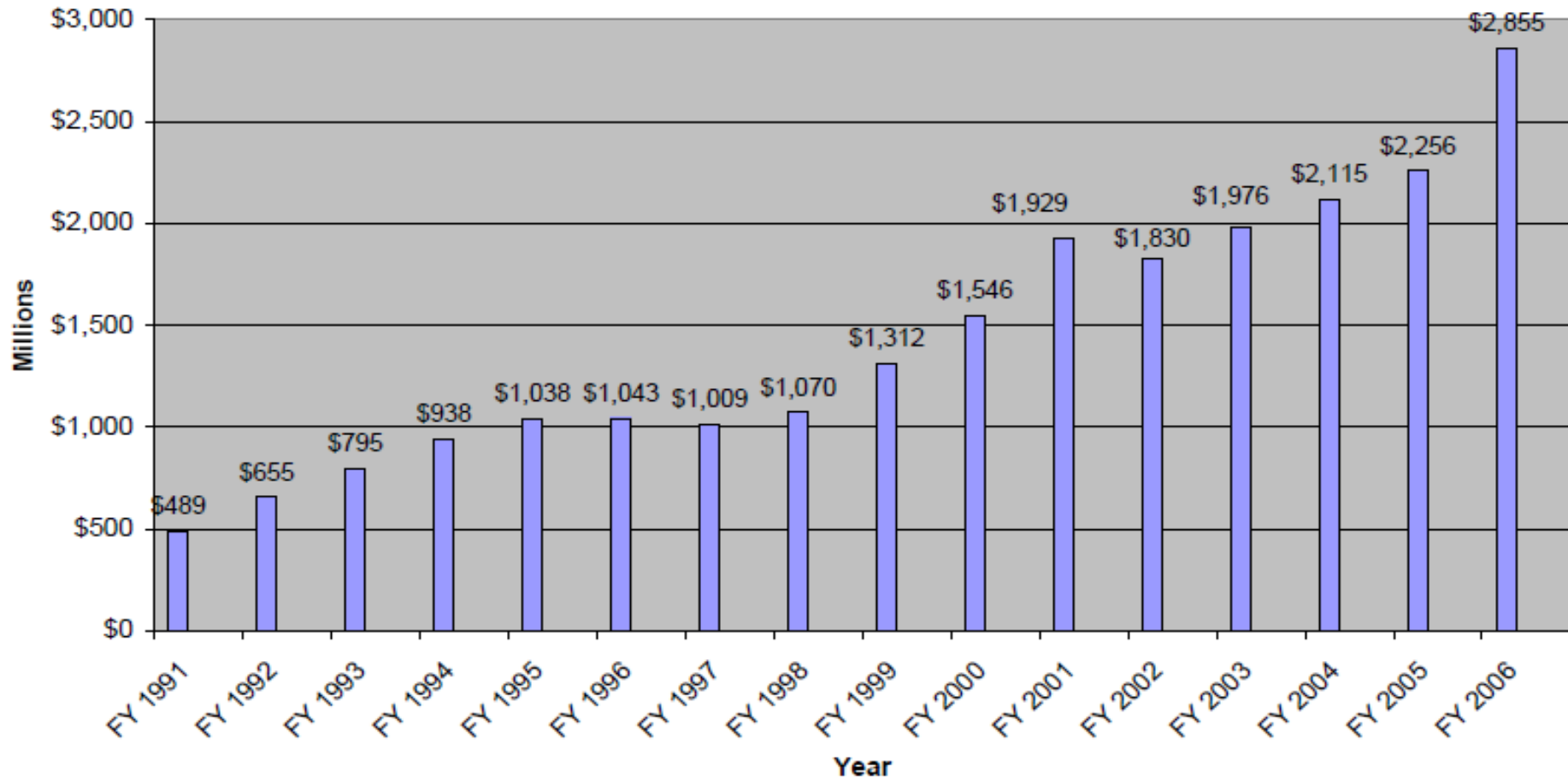
- **Program Component Areas (PCAs):**
 - High End Computing Infrastructure and Applications (HEC I&A)
 - High End Computing Research and Development (HEC R&D)
 - Cyber Security and Information Assurance (CSIA)
 - Human-Computer Interaction and Information Management (HCI&IM)
 - Large Scale Networking (LSN)
 - High Confidence Software and Systems (HCSS)
 - Social, Economic and Workforce Implications of IT (SEW)
 - Software Design and Productivity (SDP)
- **Broad participation: R&D conducted by thousands of researchers spanning government laboratories, national laboratories, universities, and private-sector partnerships**
- **Technical Leadership: NITRD efforts shape national R&D agendas**

NITRD Program Coordination Structure





NITRD Program Budget History



Source: Annual Supplements to the President's Budget



NCO/NITRD Objectives

- **The National Coordination Office (NCO) for NITRD supports the Program's multi-agency technical activities.**
- **The NCO's objectives are:**
 - To support NITRD-related policy making in the White House Office of Science and Technology Policy (OSTP)
 - To serve as the Federal focal point for interagency technical planning, budget planning, and coordination for the Federal NITRD Program
 - To serve as a source of timely, high-quality, technically accurate, in-depth information on accomplishments, new directions, and critical challenges relevant to the NITRD Program

- **PCAST assigned responsibilities of the President's Information Technology Advisory Committee (PITAC) (PITAC established under the High-Performance Computing Act of 1991, Public Law 102-194)**
- **This advisory committee shall provide the Director [of the Office of Science and Technology Policy] with an independent assessment of:**
 - (1) progress made in implementing the [Networking and Information Technology Research and Development (NITRD)] Program;
 - (2) the need to revise the Program;
 - (3) the balance between the components of the Program;
 - (4) whether the research and development undertaken pursuant to the Program is helping to maintain United States leadership in [networking and information] technology; and
 - (5) other issues identified by the Director.

Progress to Date

- Established Technical Advisory Group of experts to draw on for additional technical information and expertise
- Meeting held with government representatives of the NITRD Program community to solicit information on the NITRD Program and related coordination
- Series of meetings held with government, academia and industry, on topics that included each of the NITRD Program Component Areas and other topics (e.g., entrepreneurship and workforce)
- Contract in place for developing a snapshot of the global networking and information technology ecosystem
- Report completion targeted for Spring 2007

- Publicly reported information available via presentations (Sept 12 agenda at <http://www.ostp.gov/PCAST/pcast.html>)



Snapshot of the Global Networking and Information Technology Ecosystem

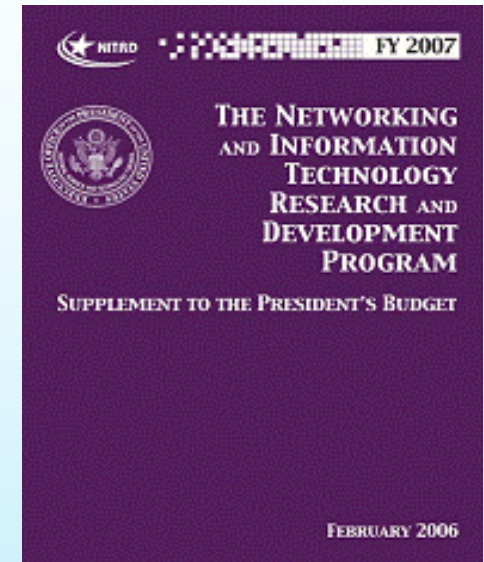
- **Networking and IT R&D does not stand alone—it is a part of a larger ecosystem**
 - Components of this ecosystem include technology transfer, infrastructure, entrepreneurship, a skilled workforce, etc.
- **Baseline data on this ecosystem as it exists today—a snapshot—are needed to provide the proper context to develop PCAST findings and recommendations**
- **Science and Technology Policy Institute (STPI) of the Institute for Defense Analyses selected to prepare the snapshot**
- **Work to date includes definition of components and subcomponents of the ecosystem, metrics, data sources, and data gathering**

Closing Thoughts

- **Diverse influences on objectives of R&D programs**
 - Quest for basic knowledge
 - Desire to improve competitiveness
 - Agency missions
- **Diverse input feeds into prioritization**
 - Agency R&D priorities, interagency priorities, and White House (OMB/OSTP) priorities
 - Federal R&D plans, research agendas, research needs reports
 - External studies and reports (PITAC, PCAST, National Academies, Council on Competitiveness, much more)
- **Technology transfer is one of the keys to impact of IT R&D**
- **Awareness of what the industry is doing is important**
- **The IT R&D ecosystem is a global ecosystem**

Comments or Questions?

- More detailed information on the NITRD Program is available in the *FY 2007 Supplement to the President's Budget for the NITRD Program*
- To download a copy of the Budget Supplement or any of our other publications, please visit:
<http://www.nitrd.gov/>



Backup Slides

NITRD Program Background and Overview



Overview of the NITRD Program

- **Statutory basis for the NITRD Program**
 - High-Performance Computing Act of 1991
 - Next Generation Internet Research Act of 1998
- **One of the few formal interagency R&D efforts – regarded as a successful model of Federal interagency coordination**



Agency NITRD Budgets by PCA

FY 2007 Budget Requests (dollars in millions)

		High End Computing Infrastructure & Applications	High End Computing Research & Development	Cyber Security & Information Assurance	Human- Computer Interaction & Information Management	Large Scale Networking	High Confidence Software & Systems	Social, Economic, & Workforce Implications of IT	Software Design & Productivity	
Agency		(HEC I&A)	(HEC R&D)	(CSIA)	(HCI &IM)	(LSN)	(HCSS)	(SEW)	(SDP)	Total
NSF	2006 Estimate	220.3	62.7	57.6	207.4	82.2	41.3	91.1	47.9	810.3
	2007 Request	272.4	64.1	67.6	220.9	84.0	51.3	92.9	50.7	903.7
OSD & DoD Service research orgs.		214.6	9.8	0.6	138.5	141.8	31.2	0.2	6.9	543.7
		186.0	8.7	0.7	135.6	130.7	29.1	0.3	6.8	497.8
NIH		198.5			188.7	74.9	8.4	12.3	17.9	500.6
		194.7			183.2	74.6	8.3	12.2	17.7	490.7
DARPA			94.1	78.7	174.2	21.3				368.3
			117.7	81.6	233.2	33.2				465.7
DOE/SC		104.4	109.1			38.9		3.5		255.8
		135.3	160.4			45.0		4.0		344.7
NSA			89.2	14.1		1.0	36.2			140.5
			62.4	13.3		2.3	39.9			117.9
NASA		60.3		1.3	2.0	5.7	7.0		1.8	78.1
		63.9		1.3	2.0	6.0	7.0		1.8	82.0
AHRQ					40.1	21.6				61.7
					37.3	20.0				57.3
NIST		2.3	1.2	9.1	7.8	4.3	9.6		4.6	38.9
		2.3	1.2	11.1	9.8	4.3	9.6		4.6	42.9
DOE/NNSA		10.0	15.9			1.6		4.6	3.3	35.4
		9.5	23.4			1.6		4.6	2.8	41.9
NOAA		11.4	1.9		0.2	0.7			1.6	15.8
		16.4	1.9		0.5	2.9			1.6	23.3
EPA		3.3			3.0					6.3
		3.3			3.0					6.3
TOTAL (2006 Estimate)		825.0	383.9	161.3	761.9	393.9	133.6	111.6	84.0	2,855
TOTAL (2007 Request)		883.8	439.9	175.5	825.4	404.5	145.2	114.0	85.9	3,074

NITRD Member Agencies

- Agency for Healthcare Research and Quality (AHRQ)
- Defense Advanced Research Projects Agency (DARPA)
- Department of Homeland Security (DHS)*
- Department of Energy/National Nuclear Security Administration (DOE/NNSA)
- Department of Energy/Office of Science (DOE/SC)
- Environmental Protection Agency (EPA)
- National Archives and Records Administration (NARA)*
- National Aeronautics and Space Administration (NASA)
- National Institutes of Health (NIH)
- National Institute of Standards and Technology (NIST)
- National Oceanic and Atmospheric Administration (NOAA)
- National Security Agency (NSA)
- National Science Foundation (NSF)
- Office of the Secretary of Defense (OSD) and DoD Service Research Organizations

* New to NITRD Program; budget not reported in preceding table



NITRD Participating Agencies

- **Central Intelligence Agency (CIA)**
- **Department of Justice (DOJ)**
- **Department of State (DOS)**
- **Department of Transportation (DOT)**
- **Department of the Treasury (Treas)**
- **Department of Veterans Affairs (VA)**
- **Federal Aviation Administration (FAA)**
- **Food and Drug Administration (FDA)**
- **General Services Administration (GSA)**
- **Technical Support Working Group (TSWG)**
- **United States Geological Survey (USGS)**



Collaborative Vision for the NITRD Program

- **Increased NITRD interagency R&D coordination and planning activities**
- **Increased conferences, workshops, and meetings that aid in identifying NITRD needs in strategic areas that are aligned with and benefit Federal missions and national priorities**
- **Increased NITRD agency interaction and outreach with non-governmental experts to help identify and implement NITRD Program priorities**



NITRD Coordination

HEC I&A

HEC R&D

CSIA

HCI&IM

LSN

HCSS

SEW

SDP

- **The NITRD Subcommittee coordinates broad goals, policies, and directions for the Program**
 - Subcommittee members are senior NITRD agency managers
 - Serves as liaison with White House officials
 - Oversees preparation of annual NITRD Supplement to the President's Budget

HEC I&A

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- In each PCA, agency managers participate in an Interagency Working Group (IWG) or a Coordinating Group (CG)
 - IWGs and CGs, co-chaired by agency reps, meet monthly to:
 - Develop joint or multi-agency R&D efforts
 - Exchange information
 - Coordinate R&D plans across agencies to avoid duplication, leverage investments, maximize potential for widely useful results
 - Cooperate on multi-agency workshops, program and grant reviews, development of technical publications
 - Many Federal agencies, not just those in the NITRD Program, participate in IWG and CG activities
 - IWG, CG co-chairs meet as a group to discuss cross-cutting issues